Figure 1: 3:2 Pulldown

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Figure 2: 2.2 Pulldown 3,4,3,2,3,0

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25/30 Frame/sec
Progressive
Scan Frames

Source Frames
Converted Into
Interlaced Fields

50/60 Field/sec
Interlaced
Video Fields

Even Field　Odd Field　Even Field　Odd Field　Even Field　Odd Field　Even Field　Odd Field

Field 0　Field 1　Field 2　Field 3　Field 4　Field 5　Field 6　Field 7
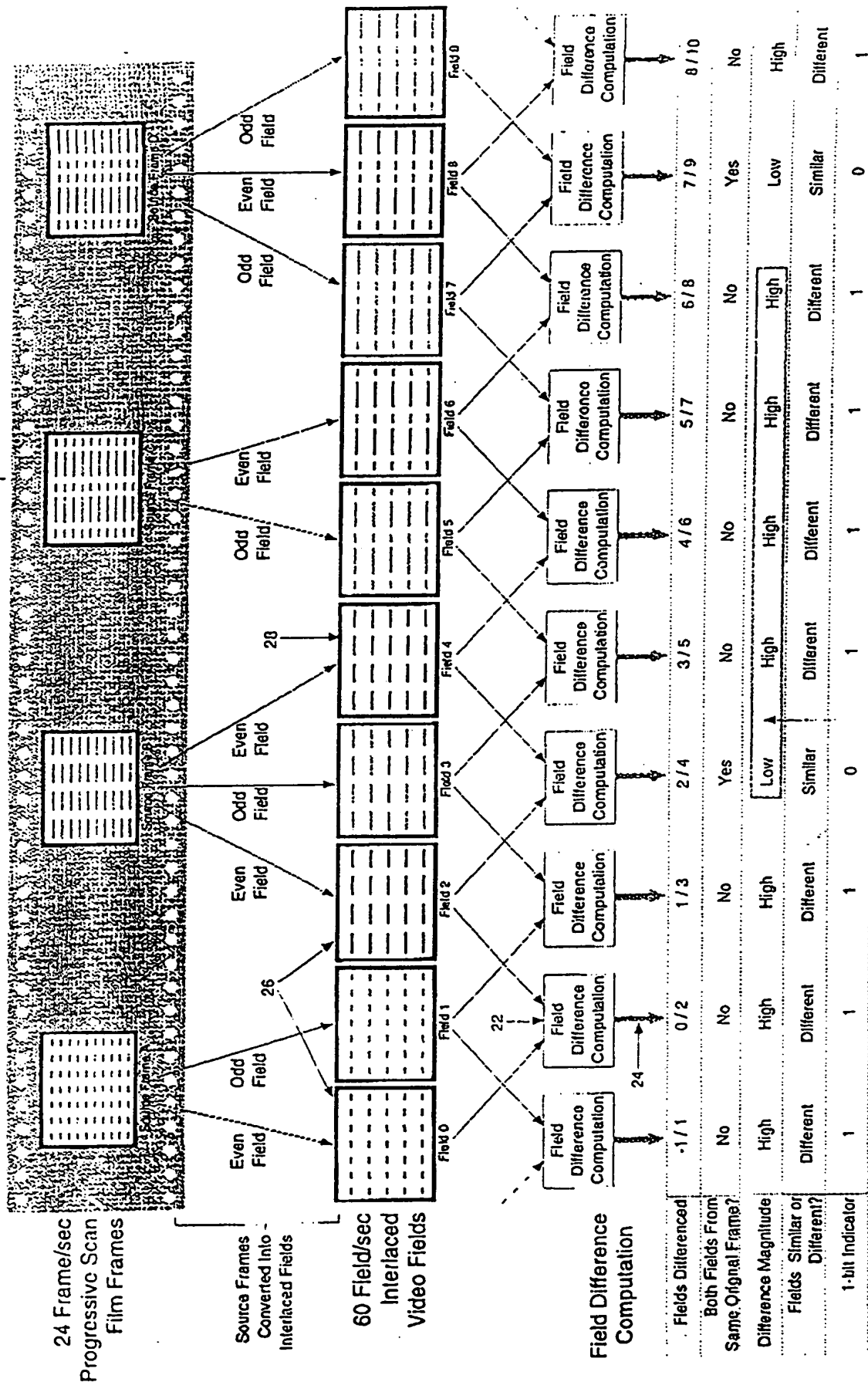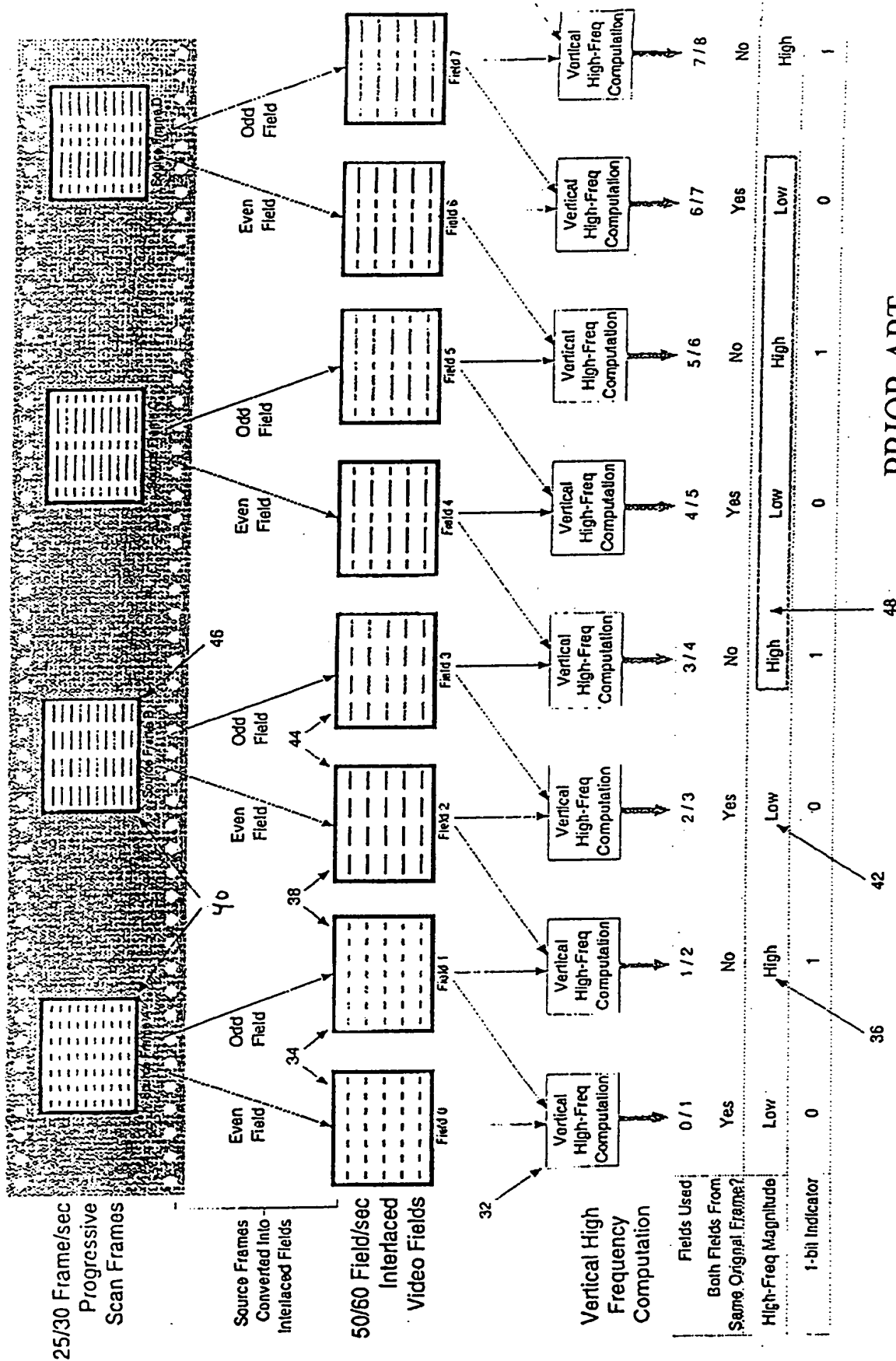
18

14

20

16
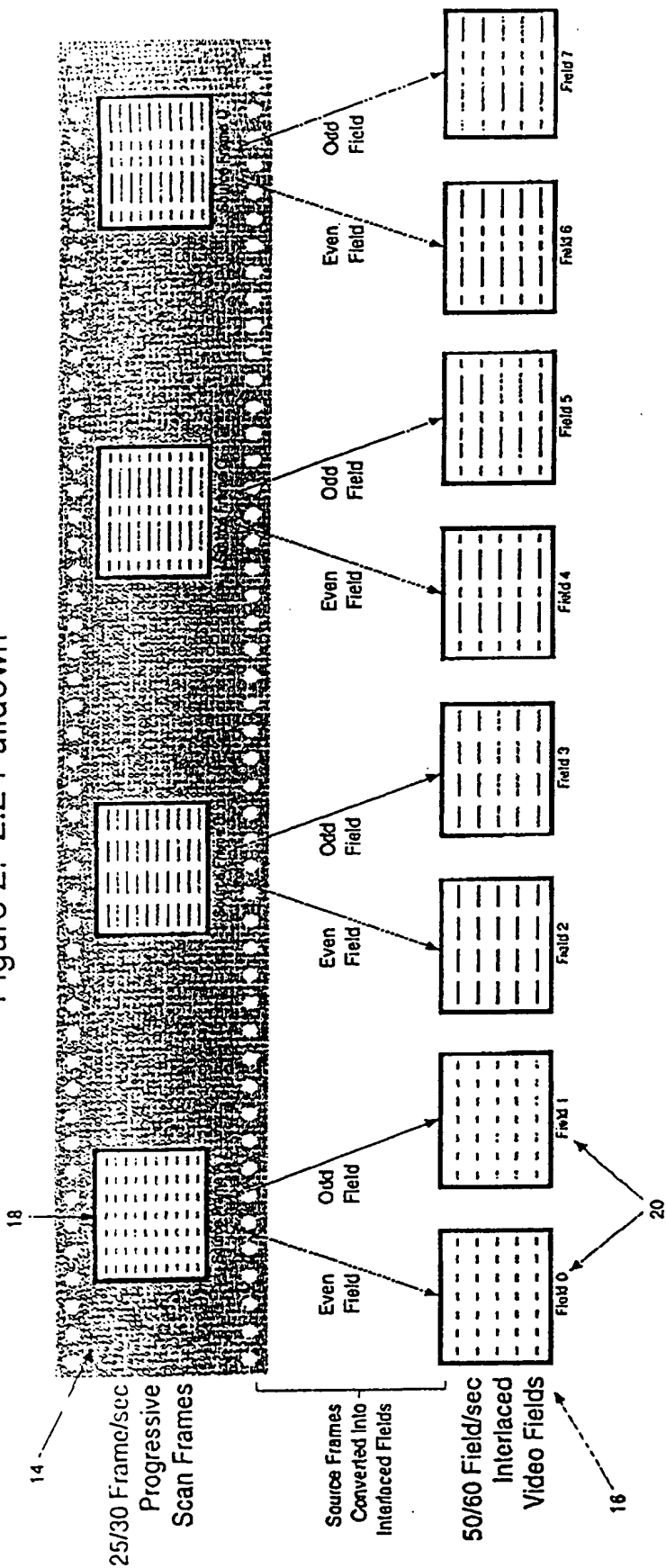
Figure 3: Even/Even & Odd/Odd Pair Field Differencing
for 3:2 Pulldown Video Field Sequence

24 Frame/sec Progressive Scan Film Frames

Source Frames Converted Into Interlaced Fields

60 Field/sec Interlaced Video Fields

Field Difference Computation

Field Difference Computation	Field 0	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	Field 8	Field 9
Fields Differenced	-1 / 1	0 / 2	1 / 3	2 / 4	3 / 5	4 / 6	5 / 7	6 / 8	7 / 9	8 / 10
Both Fields From Same Original Frame?	No	No	No	Yes	No	No	No	No	Yes	No
Difference Magnitude	High	High	High	Low	High	High	High	High	Low	High
Fields Similar or Different?	Different	Different	Different	Similar	Different	Different	Different	Different	Similar	Different
1-bit Indicator	1	1	1	0	1	1	1	1	0	1

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Figure 4: Vertical High Frequency Detection Across Even/Odd Field Pairs for 2:2 Pulldown Video Field Sequence

25/30 Frame/sec Progressive Scan Frames

Source Frames Converted Into Interlaced Fields

50/60 Field/sec Interlaced Video Fields

Even Field / Odd Field

Field 0 · Field 1 · Field 2 · Field 3 · Field 4 · Field 5 · Field 6 · Field 7

Vertical High-Freq Computation

Vertical High Frequency Computation								
Fields Used	0 / 1	1 / 2	2 / 3	3 / 4	4 / 5	5 / 6	6 / 7	7 / 8
Both Fields From Same Original Frame?	Yes	No	Yes	No	Yes	No	Yes	No
High-Freq Magnitude	Low	High	Low	High	Low	High	Low	High
1-bit Indicator	0	1	0	1	0	1	0	1

32 34 36 38 42 44 46 48

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Figure 5: Fixed Threshold Example for
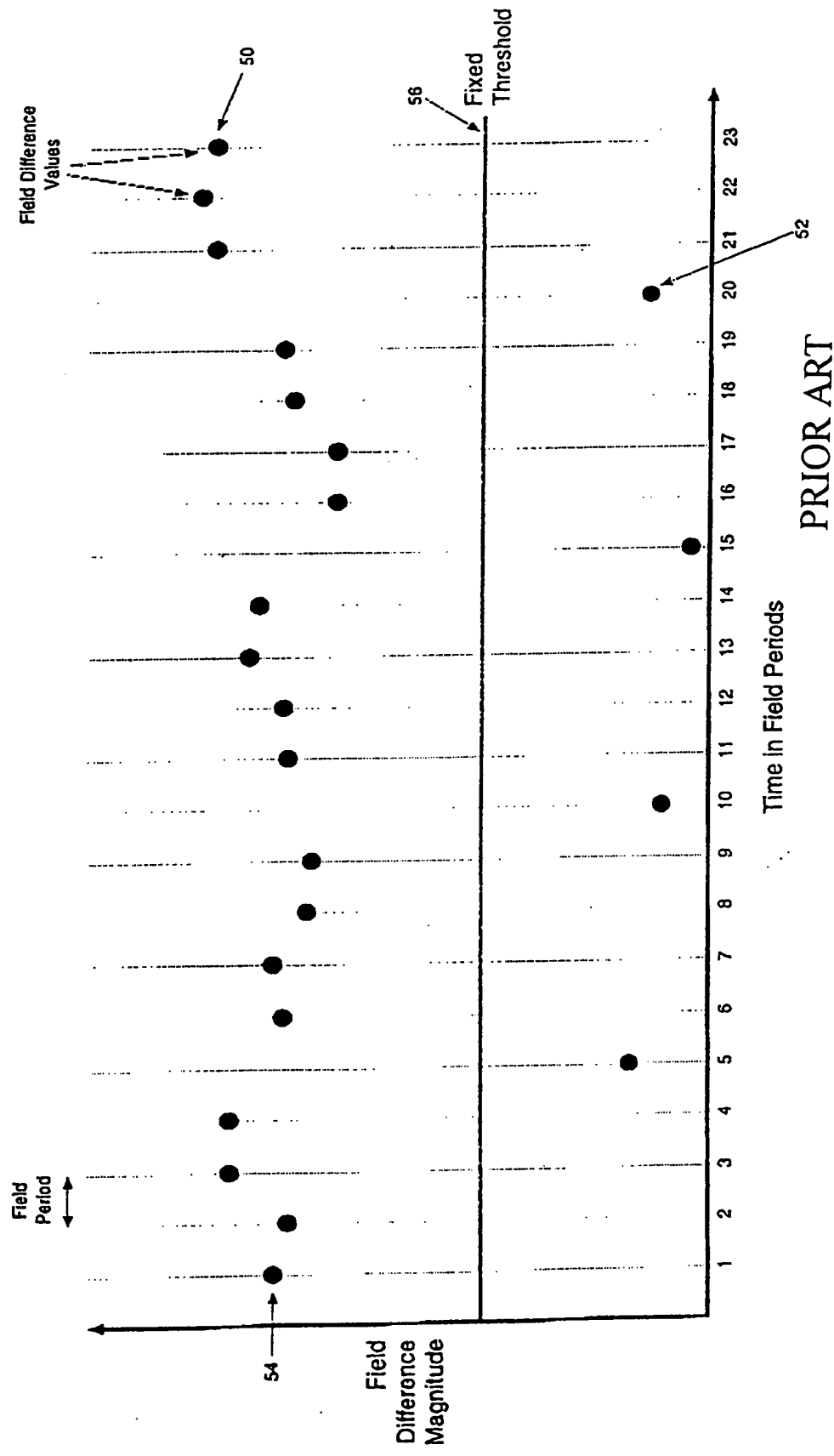High-Quality, Well-Behaved 3:2 Pulldown Source

PRIOR ART

Figure 6: Fixed Threshold Example for
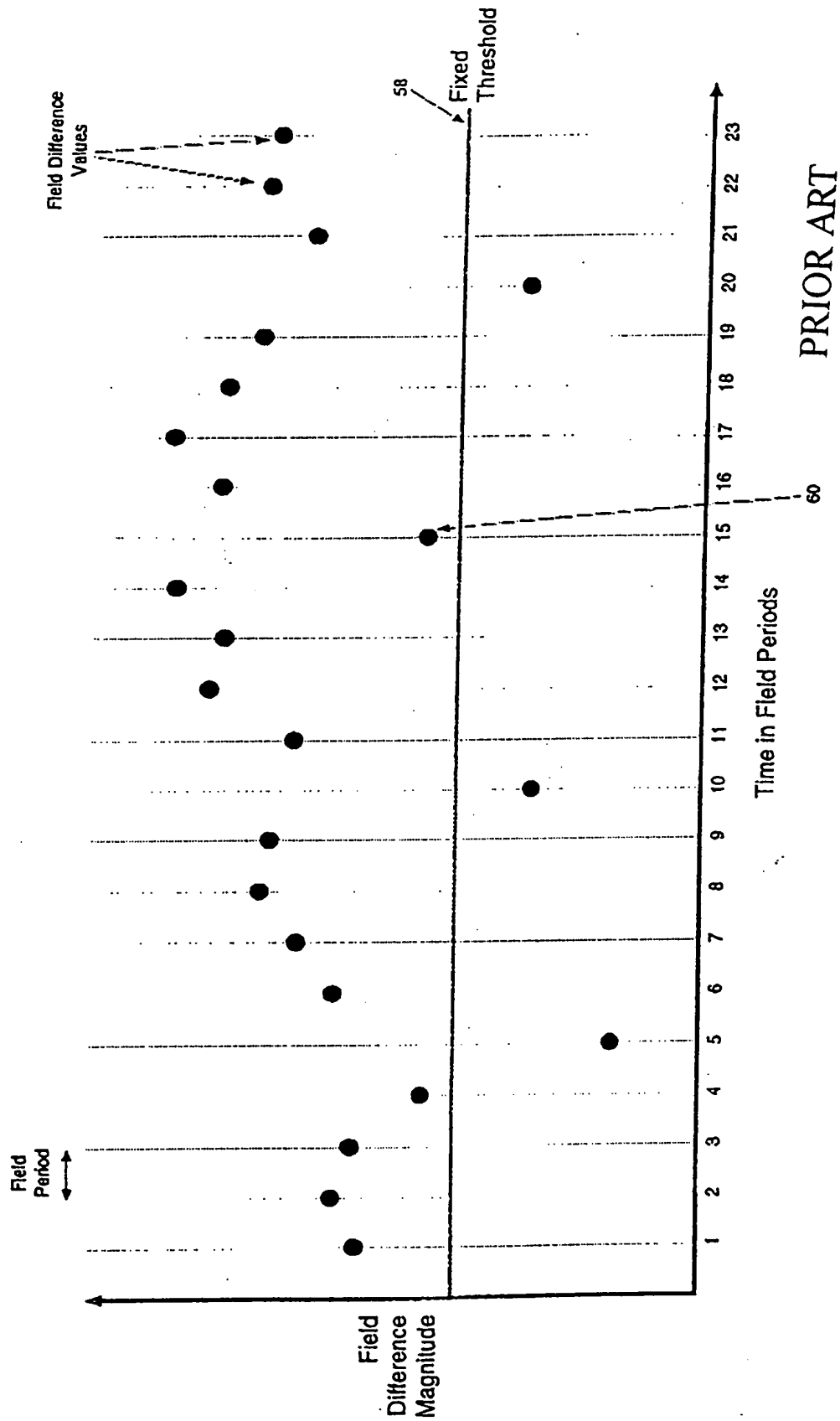Poor-Quality 3:2 Pulldown Source

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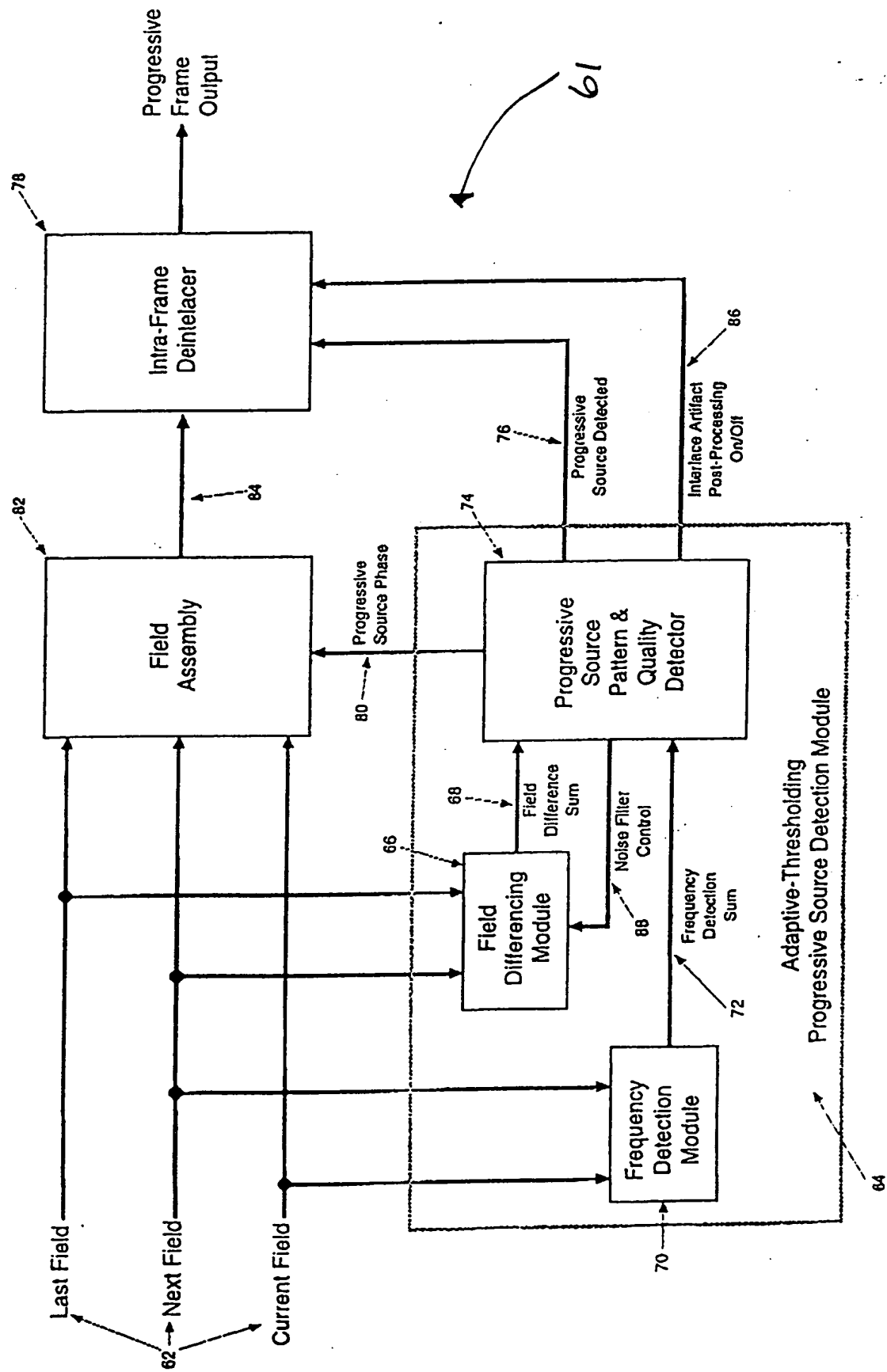Figure 7: Adaptive-Threshold Progressive Source
Detection Logic

Figure 8: Even/Odd Pair Vertical High Frequency Detection
for 3:2 Pulldown Video Field Sequence

24 Frame/sec Progressive Scan Film Frames

Source Frames Converted Into Interlaced Fields

60 Field/sec Interlaced Video Fields

Vertical High Frequency Computation

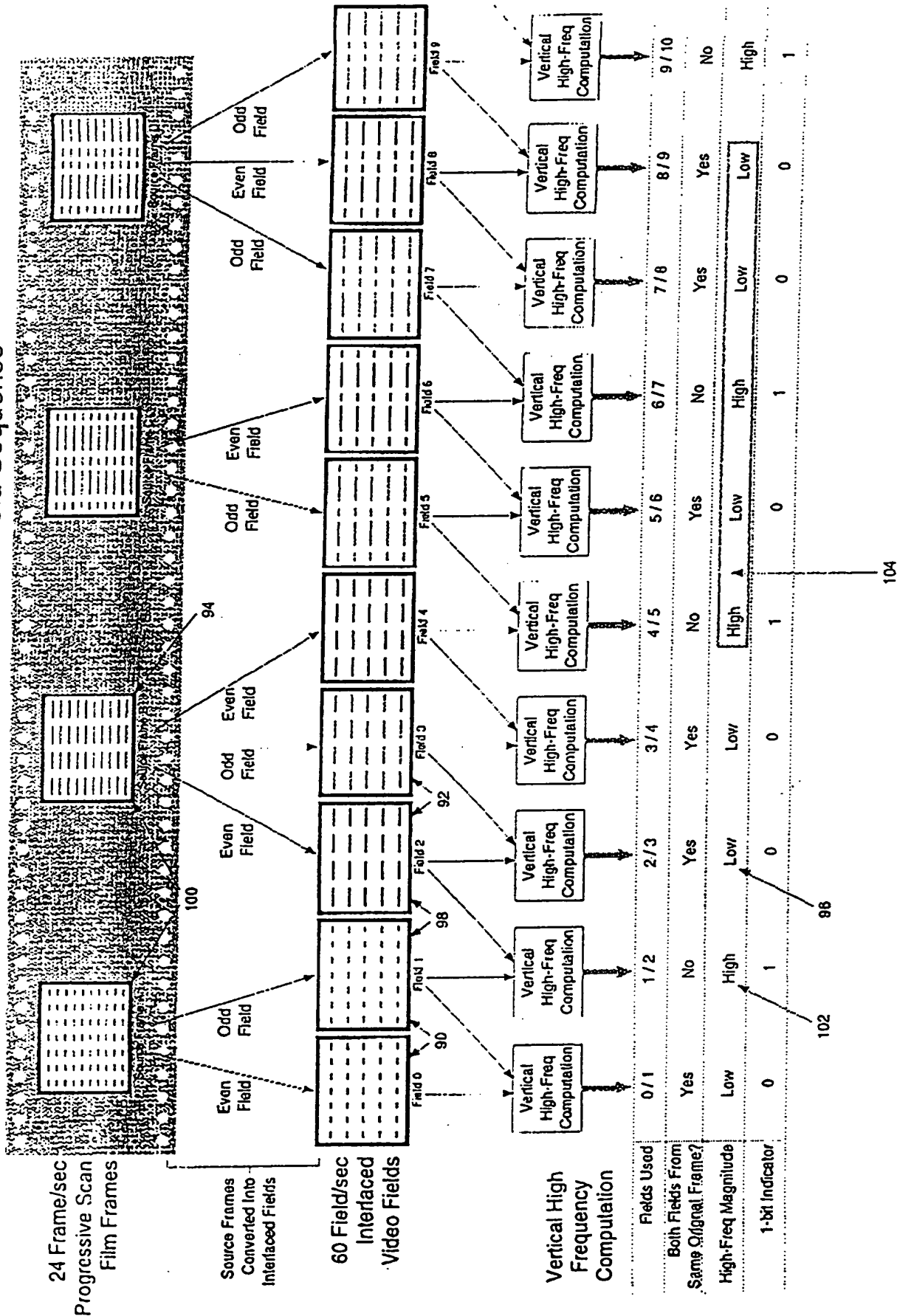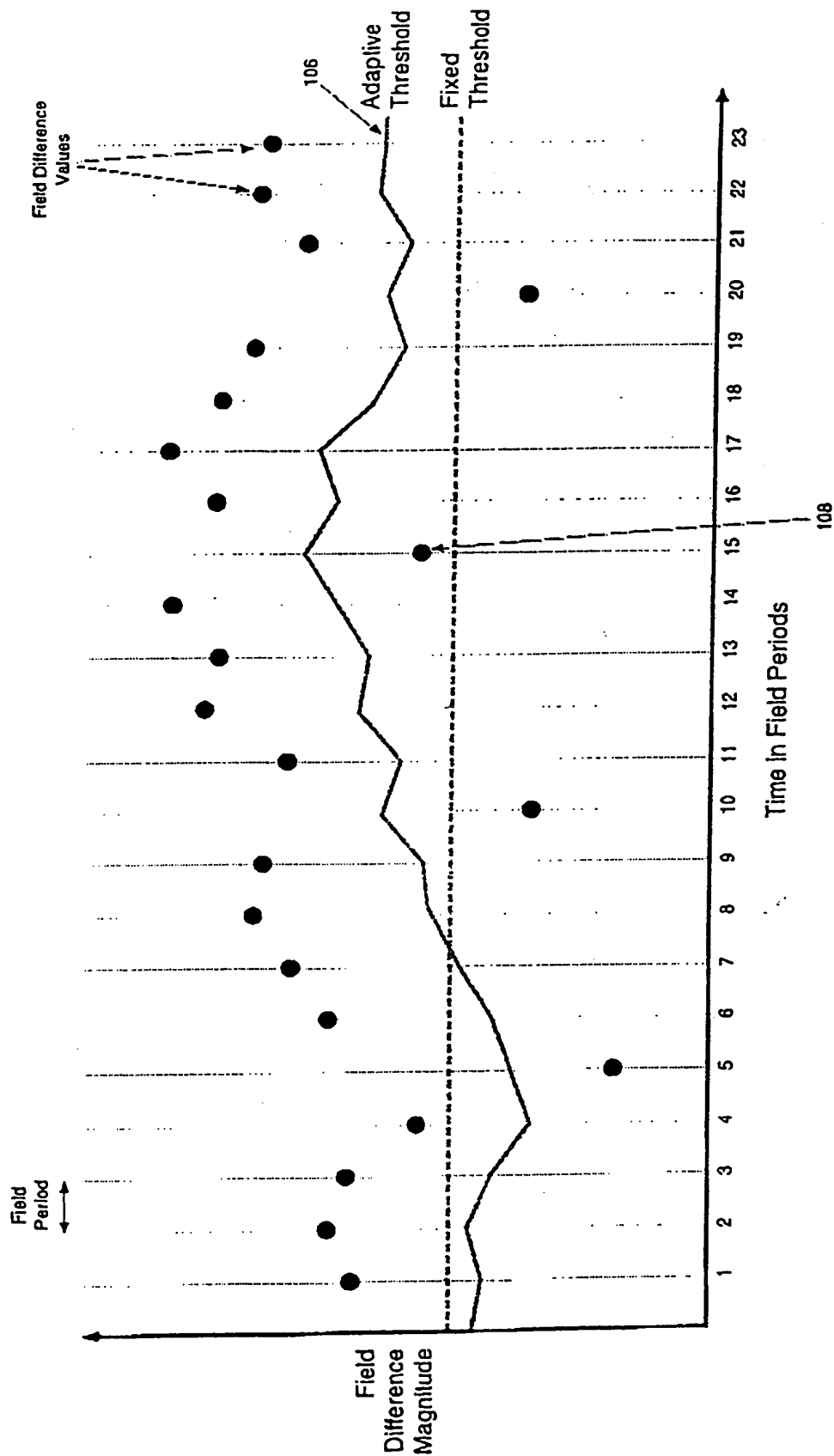| Fields Used	0 / 1	1 / 2	2 / 3	3 / 4	4 / 5	5 / 6	6 / 7	7 / 8	8 / 9	9 / 10
Both Fields From Same Original Frame?	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	No
High-Freq Magnitude	Low	High	Low	Low	High	Low	High	Low	Low	High
1-bit Indicator	0	1	0	0	1	0	1	0	0	1

Figure 9: Adaptive Threshold Example
for Poor-Quality 3:2 Pulldown Source

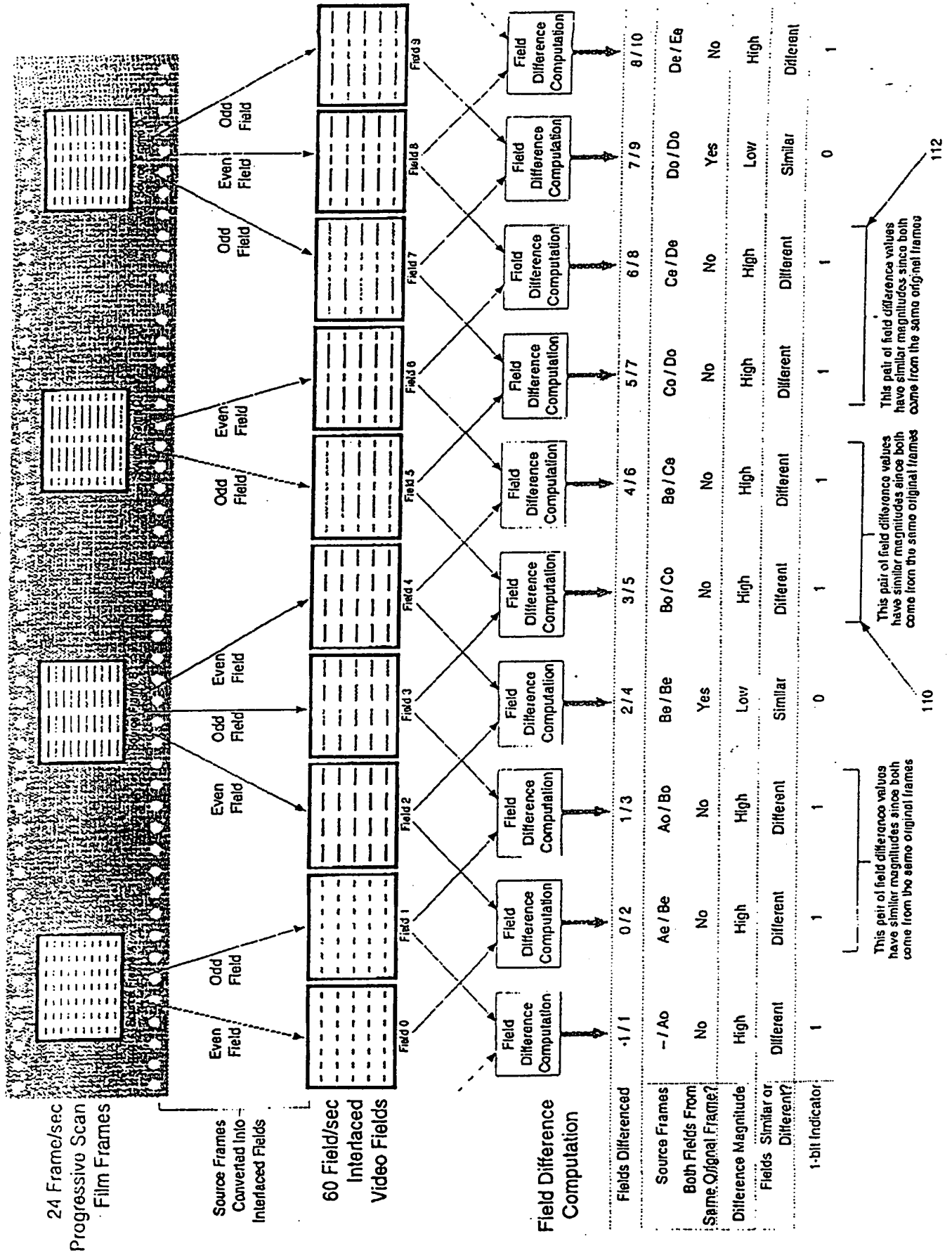## Figure 10: Even/Even & Odd/Odd Pair Field Differencing for 3:2 Pulldown Video Field Sequence With Pair Values

24 Frame/sec Progressive Scan Film Frames

Source Frames Converted Into Interlaced Fields

60 Field/sec Interlaced Video Fields

Field Difference Computation

Field Difference Computation										
Fields Differenced	-1/1	0/2	1/3	2/4	3/5	4/6	5/7	6/8	7/9	8/10
Source Frames Both Fields From Same Original Frame?	−/Ao No	Ae/Be No	Ao/Bo No	Be/Be Yes	Bo/Co No	Be/Ce No	Co/Do No	Ce/De No	Do/Do Yes	De/Ee No
Difference Magnitude	High	High	High	Low	High	High	High	High	Low	High
Fields Similar or Different?	Different	Different	Different	Similar	Different	Different	Different	Different	Similar	Different
1-bit Indicator	1	1	1	0	1	1	1	1	0	1

This pair of field difference values have similar magnitudes since both come from the same original frames   110

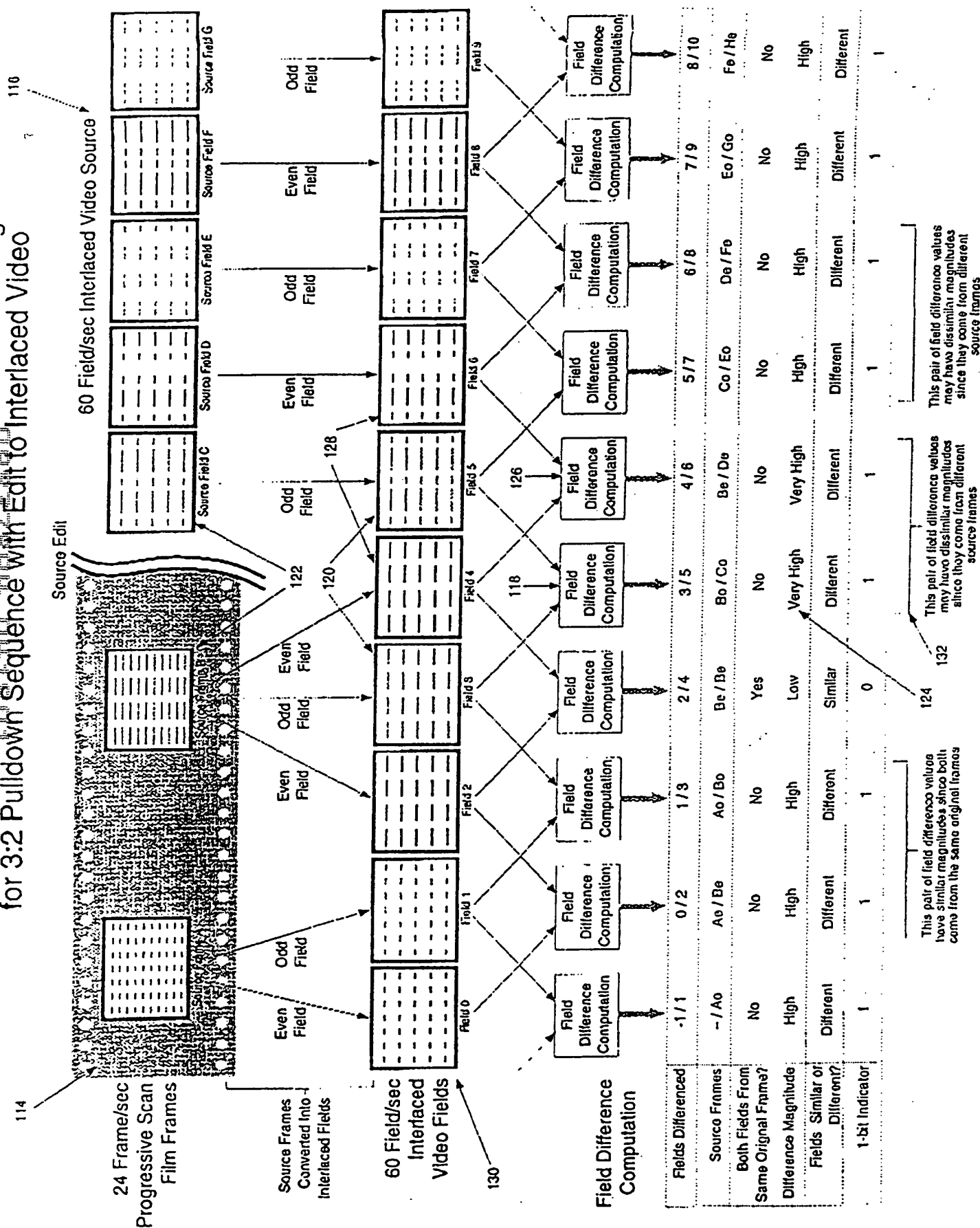This pair of field difference values have similar magnitudes since both come from the same original frames   112

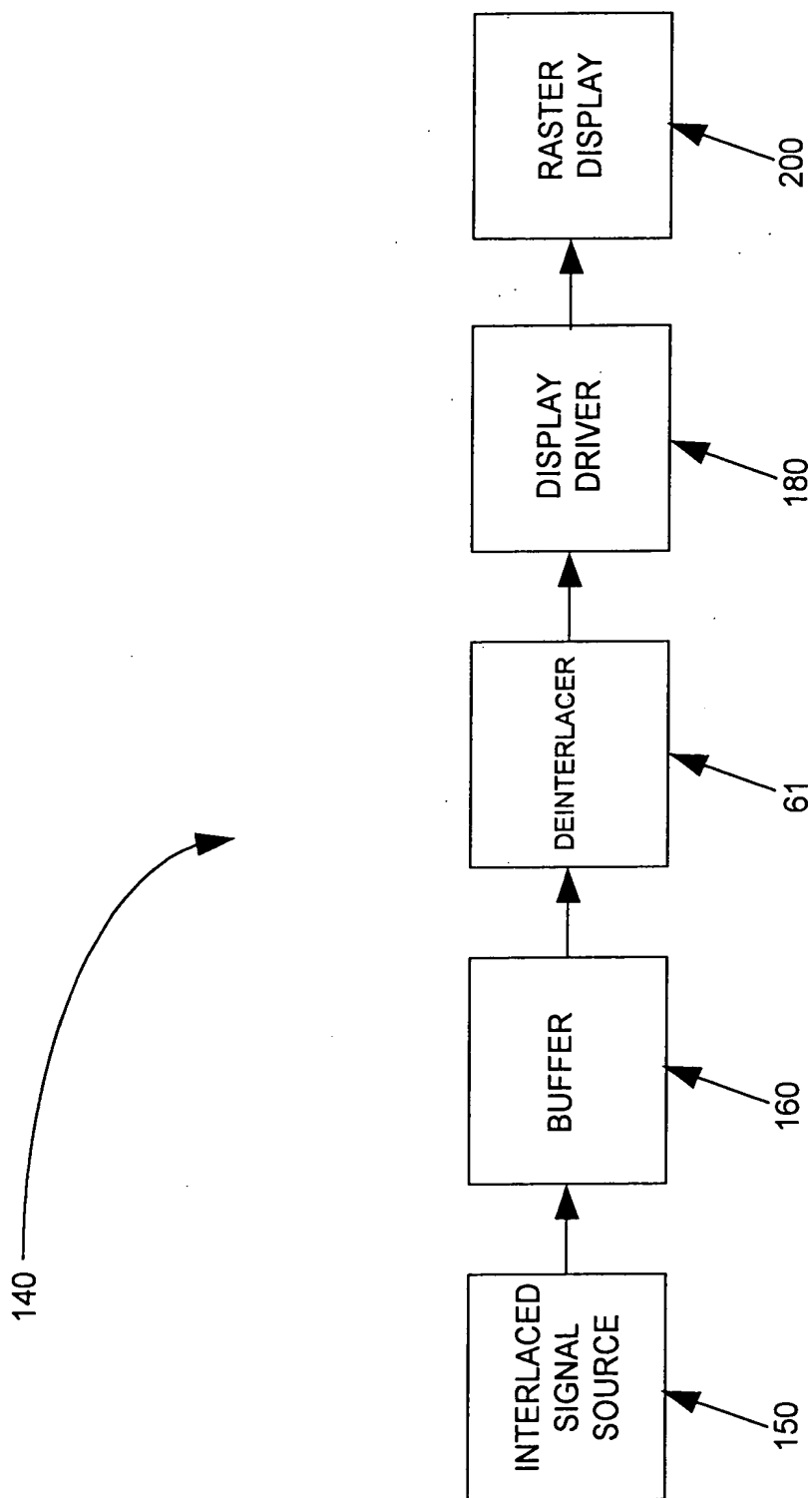Figure 11: Even/Even & Odd/Odd Pair Field Differencing for 3:2 Pulldown Sequence With Edit to Interlaced Video

Field Difference Computation											
Fields Differenced	-1 / 1	0 / 2	1 / 3	2 / 4	3 / 5	4 / 6	5 / 7	6 / 8	7 / 9	8 / 10
Source Frames	-- / Ao	Ao / Be	Ao / Bo	Be / Be	Bo / Co	Be / De	Co / Eo	De / Fe	Eo / Go	Fe / He
Both Fields From Same Original Frame?	No	No	No	Yes	No	No	No	No	No	No
Difference Magnitude	High	High	High	Low	Very High	Very High	High	High	High	High
Fields Similar or Different?	Different	Different	Different	Similar	Different	Different	Different	Different	Different	Different
1-bit Indicator	1	1	1	0	1	1	1	1	1	1

INTERLACED
SIGNAL
SOURCE
150

BUFFER
160

DEINTERLACER
61

DISPLAY
DRIVER
180

RASTER
DISPLAY
200

140

FIGURE 12